63.

area one arch $y = \sin(kx) = \frac{2}{k}$

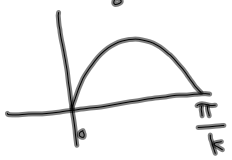
period $\frac{2\pi}{k}$

$$\int_0^{\frac{\pi}{k}} \sin(kx)\,dx = -\frac{1}{k}\cos(kx)\Big|_0^{\frac{\pi}{k}}$$

$$= -\frac{1}{k}\cos\pi - -\frac{1}{k}\cos 0$$

$$= \frac{1}{k} + \frac{1}{k}$$

$$= \frac{2}{k}$$



Nov 17-10:05 AM

5.4b Fundamental Theorem of Calculus

proof of ftc

definite integral

I $\int_a^b f(x)\,dx = F(b) - F(a)$

$F(x)$ is an antiderivative of $f(x)$

$\left(F(x) = \int f(x)\,dx\right)$

indefinite integral

II $\frac{d}{dx}\int_a^x f(t)\,dt = f(x)$

$\frac{d}{dx}\left(F(x) - F(a)\right) = f(x)$

Nov 13-5:36 PM

1.1 1.2 1.3 *Unsaved

$$\frac{d}{dx}\left(\int_{-\pi}^{x} (\cos(t))\,dt\right) =$$ cos x

$$\frac{d}{dx}\left(\int_0^x \left(\frac{1}{1+t^2}\right)dt\right) =$$ $\frac{1}{1+x^2}$

Nov 13-5:38 PM

1.2 1.3 1.4 *Unsaved

$$\frac{d}{dx}\left(\int_1^{x^2} (\cos(t))\,dt\right) =$$

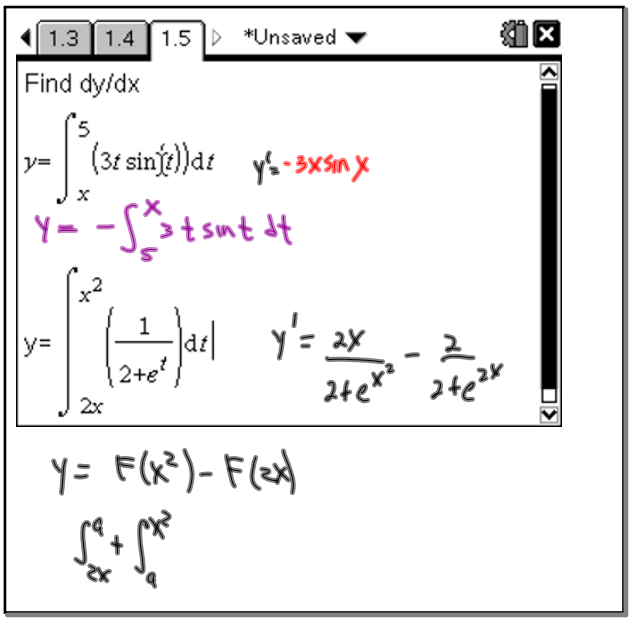
inside function

der of inside

$2x \cdot \cos(x^2)$

ch, ch, ch, chain rule

Nov 13-5:45 PM



Nov 13-5:47 PM

Find a function $y = f(x)$ with derivative $dy/dx = \tan(x)$ that satisfies the condition $f(1)=2$. Graph the function.

$f'(x) = \tan(x)$

$x=1,\ y=2$

$y = \int_{a=1}^{x} \tan(t)\,dt + 2$

$y = F(x) - F(a)$

$2 = F(1) - F(a)$

$\frac{dy}{dx} = \tan x$

$\int_{a=1}^{1} \tan t\,dt +$

$y = \int_{1}^{x} \tan(t)\,dt + 2$

$f(x) = \int_a^x f'(t)\,dt + f(a)$

Nov 13-5:57 PM